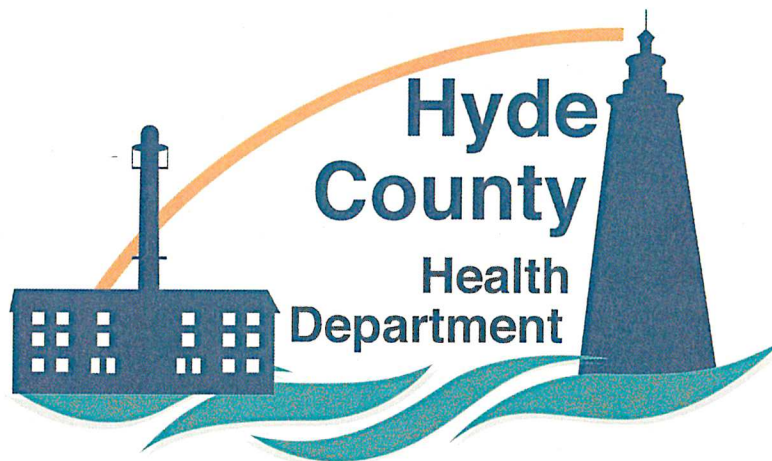


# *After the Storm*



*From the Lodge to the Lighthouse*  
We're striving for a healthier Hyde

# PROTECT YOUR FAMILY FROM THE DANGERS OF FLOOD WATER

## Injury, Infection, Disease - NO RECREATIONAL ACTIVITIES IN FLOOD WATER

Flood water can carry debris, chemicals, and sewage which can cause injuries, disease, or infection. Flood water may also contain sharp objects, such as glass or metal fragments, that can cause injury and lead to infection.

Do not engage in recreational activities or allow children to play in flood water.

## Eating and Drinking

Eating or drinking anything contaminated by flood water can cause diarrheal disease. Practice good hygiene (handwashing) after contact with flood water. Wash children's hands frequently (always before meals). Do not allow children to play with toys that have been contaminated by flood water and have not been disinfected.

## Open Wounds

Open wounds and rashes exposed to flood water can become infected. Avoid exposure to flood water if you have an open wound. Cover open wounds with a waterproof bandage. Keep open wounds as clean as possible by washing well with soap and clean water. If a wound develops redness, swelling, or drainage, seek immediate medical attention.

## Chemical Hazards

Be aware of potential chemical hazards during floods. Flood water may have moved hazardous chemical containers of solvents or other industrial chemicals from their normal storage places.

## Drowning

Flood water poses drowning risks for everyone, regardless of their ability to swim. Swiftly moving shallow water can be deadly, and even shallow standing water can be dangerous for small children. Vehicles do not provide adequate protection from flood water. They can be swept away or may stall in moving water.

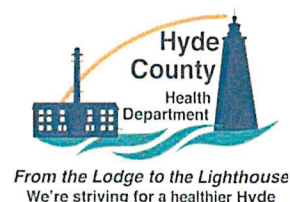
## Animal and Insect Bites

Flood water can displace animals, insects, and reptiles. To protect yourself and your family, be alert and avoid contact.

## Electrical Hazards

Avoid downed power lines.

For more information visit <http://www.cdc.gov/disasters/floods/index.html>.



# What to Do After the Flood

Drilled, driven or bored wells are best disinfected by a well or pump contractor, because it is difficult for the private owner to thoroughly disinfect these wells.

If you suspect that your well may be contaminated, contact your local or state health department or agriculture extension agent for specific advice on disinfecting your well. The suggestions below are intended to supplement flood precautions issued by State and local health authorities.

**WARNING!**  
**DO NOT TURN ON THE PUMP**  
There is danger of electrical shock and damage to your well or pump if they have been flooded

**WARNING!**  
**DO NOT WASH WITH WELL WATER**  
People drinking or washing with water from a private well that has been flooded will risk getting sick.

## Well and Pump Inspection

**Flood Conditions at the Well** - Swiftly moving flood water can carry large debris that could loosen well hardware, dislodge well construction materials or distort casing. Coarse sediment in the flood waters could erode pump components. If the well is not tightly capped, sediment and flood water could enter the well and contaminate it. Wells that are more than 10 years old or less than 50 feet deep are likely to be contaminated, even if there is no apparent damage. Floods may cause some wells to collapse.

**Electrical System** - After flood waters have receded and the pump and electrical system have dried, do not turn on the equipment until the wiring system has been checked by a qualified electrician, well contractor, or pump contractor. If the pump's control box was submerged during the flood all electrical components must be dry before electrical service can be restored. Get assistance in turning the pump on from a well or pump contractor.

**Pump Operation** - All pumps and their electrical components can be damaged by sediment and flood water. The pump including the valves and gears will need to be cleaned of silt and sand. If pumps are not cleaned and properly lubricated they can burn out. Get assistance from a well or pump contractor who will be able to clean, repair or maintain different types of pumps.



# Emergency Disinfection of Wells that have been Flooded

*Before Disinfection: Check the condition of your well. Make sure there is no exposed or damaged wiring. If you notice any damage, call a professional before the disinfection process.*

## Materials Needed:

- One gallon of non-scented household liquid bleach;
- rubber gloves;
- eye protection;
- old clothes; and
- a funnel.



### Step 1

If your water is muddy or cloudy, run the water from an outside spigot with a hose attached until the water becomes clear and free of sediments.

### Step 2



Determine what type of well you have and how to pour the bleach into the well. Some wells have a sanitary seal with either an air vent or a plug that can be removed (a). If it is a bored or dug well, the entire cover can be lifted off to provide a space for pouring the bleach into the well (b).



### Step 3

Take the gallon of bleach and funnel (if needed) and carefully pour the bleach down into the well casing.



### Step 4

After the bleach has been added, run water from an outside hose into the well casing until you smell chlorine coming from the hose. Then turn off the outside hose.

### Step 5

Turn on all cold water faucets, inside and outside of house, until the chlorine odor is detected in each faucet, then shut them all off. If you have a water treatment system, switch it to bypass before turning on the indoor faucets.



### Step 6

Wait 6 to 24 hours before turning the faucets back on. It is important not to drink, cook, bathe or wash with this water during the time period --- it contains high amounts of chlorine.

### Step 7

Once the waiting period is up, turn on an outside spigot with hose attached and run the water into a safe area where it will not disturb plants, lakes, streams or septic tanks. Run the water until there is no longer a chlorine odor. Turn the water off.



### Step 8

The system should now be disinfected, and you can now use the water.

### Step 9

Have your water tested for bacteria 7 to 10 days after disinfection.



## Sampling and Testing the Well Water

Contact the local health department to have well water sampled and tested for contamination. Or, call your state laboratory certification officer to find a certified lab near you. You can get this number from the Safe Drinking Water Hotline (1-800-426-4791).

If the health department issues sterile bottles for the private well owner to collect water samples, follow all instructions for the use of these bottles.

After the pump is back in operation, the health department should sample and test the water at regular intervals.

**CAUTION:** Because of the extensive flood area and the speed and direction of ground water flow, your well may not be a safe source of water for many months after the flood. The well can become contaminated with bacteria or other contaminants. Waste water from malfunctioning septic tanks or chemicals seeping into the ground can contaminate the ground water even after the water was tested and found to be safe. It will be necessary to take long range precautions, including repeated testing, to protect the safety of drinking water.

## CONCERNS AND ADVISORIES

If in doubt about the well water supply, follow health department drinking and bathing advisories.



Remember that there is a danger of electrical shock from any electrical device that has been flooded; consult a certified electrician. Rubber boots and gloves are not adequate protection from electric shock.

Well disinfection will not provide protection from pesticides, heavy metals and other types of non-biological contamination. If such contamination is suspected, due to the nearness of these contaminant sources, special treatment is required.

Information on home water treatment units (also called point-of-use and point-of-entry units) is available from U.S. EPA by phoning the **Safe Drinking Water Hotline (1-800-426-4791)**.

If you observe chemical containers (including barrels and drums) that have moved to your property, call your state or county health department or the **Superfund Hotline (1-800-424-9346)**.

For information on long-term water quality conditions in the area, consult the state or county health department.

Well owners may have information about the construction, or testing of their well and this information will be helpful to the health department in determining water quality conditions.

Septic systems should not be used immediately after floods. Drain fields will not work until underground water has receded. Septic lines may have broken during the flood.



## Septic Systems—What to Do after the Flood

### Where can I find information on my septic system?

Please contact your local health department for additional advice and assistance. For more information on onsite/decentralized wastewater systems, call the National Environmental Services Center at (800) 624-8301 or visit their website at [www.nesc.wvu.edu](http://www.nesc.wvu.edu).



### Do I pump my tank during flooded or saturated drainfield conditions?

No! At best, pumping the tank is only a temporary solution. Under worst conditions, pumping it out could cause the tank to try to float out of the ground and may damage the inlet and outlet pipes. The best solution is to plug all drains in the basement and drastically reduce water use in the house.

### What if my septic system has been used to dispose wastewater from my business (either a home-based or small business)?

In addition to raw sewage, small businesses may use their septic system to dispose of wastewater containing chemicals. If your septic system that receives chemicals backs up into a basement or drain field take extra precautions to prevent skin, eye and inhalation contact. The proper clean-up depends on what chemicals are found in the wastewater. Contact your State or EPA for specific clean-up information.

### What do I do with my septic system after the flood?

Once floodwaters have receded, there are several things homeowners should remember:

- Do not drink well water until it is tested. Contact your local health department.
- Do not use the sewage system until water in the soil absorption field is lower than the water level around the house.
- Have your septic tank professionally inspected and serviced if you suspect damage. Signs of damage include settling or an inability to accept water. Most septic tanks are not damaged by flooding since they are below ground and completely covered. However, septic tanks and pump chambers can fill with silt and debris, and must be professionally cleaned. If the soil absorption field is clogged with silt, a new system may have to be installed.
- Only trained specialists should clean or repair septic tanks because tanks may contain dangerous gases. Contact your health department for a list of septic system contractors who work in your area.
- If sewage has backed up into the basement, clean the area and disinfect the floor. Use a chlorine solution of a half cup of chlorine bleach to each gallon of water to disinfect the area thoroughly.



- Pump the septic system as soon as possible after the flood. Be sure to pump both the tank and lift station. This will remove silt and debris that may have washed into the system. Do not pump the tank during flooded or saturated drainfield conditions. At best, pumping the tank is only a temporary solution. Under worst conditions, pumping it out could cause the tank to try to float out of the ground and may damage the inlet and outlet pipes.
- Do not compact the soil over the soil absorption field by driving or operating equipment in the area. Saturated soil is especially susceptible to compaction, which can reduce the soil absorption field's ability to treat wastewater and lead to system failure.
- Examine all electrical connections for damage before restoring electricity.
- Be sure the septic tank's manhole cover is secure and that inspection ports have not been blocked or damaged.
- Check the vegetation over your septic tank and soil absorption field. Repair erosion damage and sod or reseed areas as necessary to provide turf grass cover.

**Remember: Whenever the water table is high or your sewage system is threatened by flooding there is a risk that sewage will back up into your home. The only way to prevent this backup is to relieve pressure on the system by using it less.**

1. What are some suggestions offered by experts for homeowners with flooded septic systems?
2. Use common sense. If possible, don't use the system if the soil is saturated and flooded. The wastewater will not be treated and will become a source of pollution. Conserve water as much as possible while the system restores itself and the water table falls.
3. Prevent silt from entering septic systems that have pump chambers. When the pump chambers are flooded, silt has a tendency to settle in the chambers and will clog the drainfield if it is not removed.
4. Do not open the septic tank for pumping while the soil is still saturated. Mud and silt may enter the tank and end up in the drainfield. Furthermore, pumping out a tank that is in saturated soil may cause it to "pop out" of the ground. (Likewise, recently installed systems may "pop out" of the ground more readily than older systems because the soil has not had enough time to settle and compact.)
5. Do not dig into the tank or drainfield area while the soil is still wet or flooded. Try to avoid any work on or around the disposal field with heavy machinery while the soil is still wet. These activities will ruin the soil conductivity.
6. Flooding of the septic tank will have lifted the floating crust of fats and grease in the septic tank. Some of this scum may have floated and/or partially plugged the outlet tee. If the septic system backs up into the house check the tank first for outlet blockage. Clean up any floodwater in the house without dumping it into the sink or toilet and allow enough time for the water to recede. Floodwaters from the house that are passed through or pumped through the septic tank will cause higher flows through the system. This may cause solids to transfer from the septic tank to the drainfield and will cause clogging.
7. Locate any electrical or mechanical devices the system may have that could be flooded to avoid contact with them until they are dry and clean.
8. Aerobic plants, upflow filters, trickling filters, and other media filters have a tendency to clog due to mud and sediment. These systems will need to be washed and raked.





# FOODFACTS

From the U.S. Food and Drug Administration

## Food and Water Safety During Hurricanes, Power Outages, and Floods

### What Consumers Need to Know

*Emergencies can happen. When they do, the best strategy is to already have a plan in place. This includes knowing the proper food and water safety precautions to take if hurricanes — or other flooding/power outages — do occur.*



### Be Prepared for Emergencies

1. Make sure you have **appliance thermometers** in your **refrigerator and freezer**.
  - Check to ensure that the freezer temperature is at or below **0 °F**, and the refrigerator is at or below **40 °F**.
  - In case of a **power outage**, the appliance thermometers will indicate the temperatures in the refrigerator and freezer to help you determine if the food is safe.
2. **Freeze containers of water** for ice to help keep food cold in the freezer, refrigerator, or coolers in case the power goes out. If your normal water supply is contaminated or unavailable, the melting ice will also supply drinking water.
3. **Freeze refrigerated items** such as leftovers, milk, and fresh meat and poultry that you may not need immediately. This helps keep them at a safe temperature longer.
4. **Group food together** in the freezer. This helps the food stay cold longer.
5. **Have coolers on hand** to keep refrigerated food cold if the power will be out for more than 4 hours.
6. Purchase or make **ice cubes in advance** and store in the freezer for use in the refrigerator or in a cooler. Freeze **gel packs** ahead of time for use in coolers.
7. Check out local sources to know where **dry ice and block ice** can be purchased, just in case.
8. **Store food on shelves** that will be safely out of the way of contaminated water in case of flooding.
9. Make sure to have a **supply of bottled water** stored where it will be as safe as possible from flooding.



### Power Outages: During and After

#### When the Power Goes Out . . .

Here are basic tips for keeping food safe:

- Keep the **refrigerator and freezer doors closed** as much as possible to maintain the cold temperature.
  - The **refrigerator** will keep food **cold for about 4 hours** if it is unopened.
  - A **full freezer** will keep the temperature for approximately **48 hours** (24 hours if it is half full) if the door remains closed.
  - Buy **dry or block ice** to keep the refrigerator as cold as possible if the power is going to be out for a prolonged period of time. Fifty pounds of dry ice should hold an 18 cubic foot, fully-stocked freezer cold for two days.
- If you plan to eat refrigerated or frozen meat, poultry, fish or eggs while it is still at safe temperatures, it's important that each item is **thoroughly cooked to its proper temperature** to assure that any foodborne bacteria that may be present are destroyed. However, if at any point the food was above 40 °F for 2 hours or more — discard it.
- **Wash fruits and vegetables** with water from a safe source before eating.
- For infants, try to use prepared, canned baby formula that requires no added water. When using concentrated or powdered formulas, prepare with bottled water if the local water source is potentially contaminated.



#### Once Power Is Restored . . .

You'll need to determine the safety of your food. Here's how:

- If an appliance thermometer was kept in the freezer, **check the temperature** when the power comes back on. If the freezer thermometer reads 40 °F or below, the food is safe and may be refrozen.
- If a thermometer has not been kept in the freezer, **check each package** of food to determine its safety. You can't rely on appearance or odor. If the food **still contains ice crystals** or is 40 °F or below, it is safe to refreeze or cook.
- Refrigerated food should be safe as long as the power was out for **no more than 4 hours** and the refrigerator door was kept shut. Discard any perishable food (such as meat, poultry, fish, eggs or leftovers) that has been above 40 °F for two hours or more.



Keep in mind that perishable food such as meat, poultry, seafood, milk, and eggs that are **not kept adequately refrigerated or frozen** may cause illness if consumed, even when they are thoroughly cooked.





## When Flooding Occurs — Keep Water Safe

Follow these steps to keep your **WATER SAFE** during — and after — flood conditions.

1. Use **bottled water** that has not been exposed to flood waters if it is available.
2. If you don't have bottled water, you should **boil water** to make it safe. Boiling water will kill most types of disease-causing organisms that may be present.
  - If the water is cloudy, filter it through clean cloths, or allow it to settle and then draw off the clear water for boiling.
  - Boil the water for one minute, let it cool, and store it in clean containers with covers.
3. If you can't boil water, you can **disinfect it using household bleach**. Bleach will kill some, but not all, types of disease-causing organisms that may be in the water.
4. If you have a **well** that has been flooded, the water should be **tested and disinfected** after flood waters recede. If you suspect that your well may be contaminated, contact your local or state health department or agricultural extension agent for specific advice.



## When Flooding Occurs — Keep Food Safe

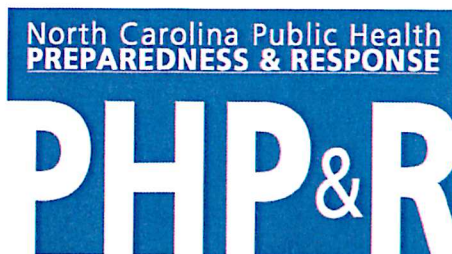
Follow these steps to keep your **FOOD SAFE** during — and after — flood conditions.

1. **Do not eat** any food that may have come into contact with flood water.
2. **Discard any food** that is **not in a waterproof container** if there is *any* chance that it has come into contact with flood water.
  - Food containers that are not waterproof include those with screw-caps, snap lids, pull tops, and crimped caps.
  - Also discard cardboard juice/milk/baby formula boxes and home canned foods if they have come in contact with flood water, because they cannot be effectively cleaned and sanitized.
3. Inspect canned foods and **discard any food in damaged cans**. Can damage is shown by swelling, leakage, punctures, holes, fractures, extensive deep rusting, or crushing/denting severe enough to prevent normal stacking or opening with a manual, wheel-type can opener.
4. Undamaged, commercially prepared foods in **all-metal cans** and **"retort pouches"** (like flexible, shelf-stable juice or seafood pouches) can be saved if you follow this procedure:
  - Remove the labels, if they are the removable kind, since they can harbor dirt and bacteria.
  - Brush or wipe away any dirt or silt.
  - Thoroughly wash the cans or retort pouches with soap and water, using hot water if it is available. Rinse the cans or retort pouches with water that is safe for drinking, if available, since dirt or residual soap will reduce the effectiveness of chlorine sanitation.
5. Sanitize cans and retort pouches by immersion in one of the two following ways:
  - Place in water and allow the water to come to a boil and continue boiling for 2 minutes, or
  - Place in a freshly-made solution consisting of 1 tablespoon of unscented liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available) for 15 minutes.
6. Air dry cans or retort pouches for a minimum of 1 hour before opening or storing.
7. If the labels were removable, then re-label your cans or retort pouches, including the expiration date (if available), with a marking pen.
8. Food in reconditioned cans or retort pouches should be used as soon as possible thereafter.
9. Any concentrated baby formula in reconditioned, all-metal containers must be diluted with clean drinking water.
5. Thoroughly wash metal pans, ceramic dishes, and utensils (including can openers) with soap and water, using hot water if available. Rinse, and then sanitize them by boiling in clean water or immersing them for 15 minutes in a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available).
6. Thoroughly wash countertops with soap and water, using hot water if available. Rinse, and then sanitize by applying a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available). Allow to air dry.



*Everyone can practice safe food handling by following these four simple steps:*





# Hurricane Fact Sheet

## Important Precautions During and After a Hurricane

### Avoid Dangerous Areas

- If waters continue to rise, evacuate the area immediately.
- Do not walk in, play in or drive through flooded areas. Flood water contains hidden hazards and may be deeper and faster-moving than it appears. Wear shoes at all times.
- Stay away from downed power lines.
- If you get a cut or puncture wound, get a tetanus booster shot if you have not had one in the past 5 years.

### Drinking Water

- Public and private wells that have been flooded or have lost electricity may have become contaminated. Water must be treated before use (see below). Contact your health department about well water testing.
- Use only bottled water for drinking and cooking, if available.
- Tap water used for drinking, cooking, brushing teeth or making ice must be boiled for at least five minutes before use.
- Pregnant women and children should use bottled water instead of tap water or boiled water. Baby formula should be made with bottled water. Boiled water is not good for babies and pregnant women. However, if bottled water is not available, do not use untreated water--use boiled water until bottled water becomes available.
- If you cannot boil your tap water, it can be treated with liquid chlorine bleach, using 8 drops (1/4 teaspoon) to one gallon of tap water. (WARNING! Do not use bleach that is scented or contains soap.) Mix thoroughly and let stand for 30 minutes before using.
- Do not use floodwaters for any use.

### Food and Medicines

- Any foods (including those in cans, plastic or glass), medicines and cosmetics that have come in contact with floodwaters should not be eaten. Throw them away.
- Food in the refrigerator should be thrown away if the power has been off for more than 4 hours or if food is warmer than 41 degrees Fahrenheit.
- Frozen food should be thrown away if it has thawed. Do not re-freeze thawed food.
- Medicines and cosmetics that have been in flood waters should be thrown away.





## **Hurricane Fact Sheet: Important Precautions During and After a Hurricane**

### **Septic tanks**

- If your septic tank has been flooded, do not use the plumbing system while the septic tank is still under water.
- Do not use your plumbing system if sewage water has backed up into your home.
- Try to reduce the amount of debris that enters the septic tank or drains.
- Avoid contact with sewage from a septic tank that is not operating.
- For information on repairing or constructing a septic tank system, contact your local health department.

### **Insects and other animals**

- Bees, wasps, fire ants, snakes and other animals have lost their homes and may be very dangerous. Avoid contact with these animals as much as possible. Be cautious in moving items where animals could be hiding.
- Standing waters are breeding grounds for mosquitoes. Use insect repellent, long sleeves, pants, socks and shoes, if possible. Empty standing water from containers inside and outside the home.
- Avoid touching dead animals.

### **Cleaning up your home**

Take extra precautions to protect your health and safety. If your home was flooded during the hurricane, assume that everything touched by flood water is contaminated and will have to be disinfected or thrown out. Most clean up can be done with household cleaning products.

**Remember to wash your hands frequently during clean up and always wear rubber gloves, a disposable dust/mist face mask (NIOSH approved N-95 type) and, if possible, waterproof boots.** If your ceiling was damaged, wear a hard hat and safety glasses.

#### **If your home has been flooded, you should:**

- Before turning the power back on, have your home's electrical system checked out by an electrician.
- If the pilot light on your natural gas furnace, hot-water heater or stove has gone out, have it re-lit by a professional.
- Throw away flood-contaminated mattresses, upholstered furniture, carpets and padding, wallboard and wallpaper because they can not be cleaned all the way through.
- Clean plaster or tile walls, hard-surface floors and other household surfaces by scrubbing with soap and water and disinfect them with a solution of one cup of bleach to four gallons of water. Pay particular attention to areas that come in contact with food, or where small children play. After cleaning a room or item, go over it again with disinfectant to kill germs and odors left by flood waters. Dry everything completely after cleaning.
- Use a two-bucket method when cleaning. Put cleaning solution in one bucket and rinse water in the other. Replace rinse water frequently.



## **Hurricane Fact Sheet:** Important Precautions During and After a Hurricane

- Wash all linens and clothing in hot water with a disinfectant, or dry clean them. Throw them away if they are moldy or mildewed.
- Materials should be completely dry before cleaning, or mold and mildew will grow. If items cannot be completely dried out, throw them away.
- If materials become moldy or smell musty, they are probably contaminated and should be thrown away.
- Remove mildew on hard surfaces with household mildew cleaner; a mixture of five tablespoons washing soda or trisodium phosphate to a gallon of water; or 1/4 cup of laundry bleach to a gallon of water.
- If sewage backed up into your home, wear rubber boots and waterproof gloves during cleanup. Remove and discard contaminated household goods such as wall coverings, rugs, upholstered furniture, cloth and drywall that can't be disinfected.
- Avoid touching dead animals. Use gloves or a shovel to move dead animals, and then wash hands thoroughly. Contact your local health department about proper disposal of dead animals.
- Empty standing water out of birdbaths, tires, flower pots and other containers.

For more information on cleaning up after a flood, contact your local Emergency Management Office, county health department or Red Cross chapter. You can also get information from the following internet sites: <http://www.redcross.org> or <http://www.fema.gov>, and <http://www.dhhs.state.nc.us>







# Hurricane Fact Sheet

## After the Storm: Injury Prevention

A severe storm can leave many problems in its wake. The media is usually filled with stories of people who are injured after a storm passes by. Don't become a statistic:

- **Follow orders** of any emergency service personnel.
- **Drive cautiously.** Do not drive through flooded roads. Water may be deeper than it appears. Twenty-four of the 52 deaths attributed to Hurricane Floyd in 1999 occurred when motorists attempted to navigate flooded roads. An additional nine Floyd-related deaths occurred in other motor vehicle accidents.
- **Wear Life Jackets.** In the event of rising flood water, children and adults who are not strong swimmers should wear U.S. Coast Guard approved life jackets--personal flotation devices (PFDs)--whenever they are in or around the water. Everyone, including strong swimmers, should wear a Coast Guard approved PFD when in a boat used for rescue or escape. Select the PFD for the person's weight and size (printed on the label). For workers, NIOSH recommends that they avoid working alone and wear a Coast Guard approved life jacket when working in or near flood waters.
- **Watch out for loose or dangling power lines;** stay away from them and report them immediately to the proper authorities.
- **Do not leave children unattended.** Do not allow them to play in or explore damaged or flooded areas. Keep chemicals used for cleaning and disinfecting, fuel for generators, and pest-control substances out of reach of children.
- **Wear sturdy shoes or boots and protective clothing** such as heavy pants, long sleeves and gloves when cleaning up debris. Use an insect repellent containing DEET to reduce chances of mosquito bites and to reduce risk of mosquito-borne illnesses such as West Nile Virus and Eastern Equine Encephalitis. Stinging caterpillars and insects such as bees and wasps can become very aggressive after a storm. Survey the area before beginning cleanup and use a commercially available pesticide if needed. Poisonous snakes may also seek shelter in flooded homes; take precautions to avoid snakebites. Seek medical help if attacked by large numbers of insects, as reactions can be severe.
- **Animal bites have increased after past storms.** Animals may become frightened and act oddly after a storm. Be cautious when dealing with domestic animals like dogs and cats, especially those that you don't know, and avoid any contact with wild animals.
- **Don't get burned.** During past storms, reports of burn injuries have increase. If you are using camp stoves or fires to cook with, pay attention and don't get burned.
- **Protect your eyes.** Eye injuries have increased during past storms. Make sure to wear eye protection if you are handling chainsaws and watch where you are going – a storm may have placed materials at eye level that could be harmful.
- **Fight the bite.** Mosquitoes, caterpillars, bees and other stinging pests may have lost their homes during a storm. They are likely to be buzzing about and could hurt you. Apply insect repellent according to the label directions.





## **Hurricane Fact Sheet:** After the Storm: Injury Prevention

- **Watch out for snakes.** They, too, have lost their habitat and make be in places where they don't normally occur.
- **Exercise particular caution in using power tools or tackling large debris,** which can shift suddenly. Chain saws are particularly dangerous; get proper safety training before using one. Inexperienced individuals are routinely injured when using chain saws in post-storm cleanup. Falls are common; use safety equipment and get trained help with large or difficult jobs. Don't take chances.
- If the electrical power to your home is off and you cook on a charcoal or gas grill, **carbon monoxide is a threat.** A odorless, colorless gas produced by combustion, carbon monoxide can be deadly. Use a grill only in an open, well-ventilated area, never inside the house, and keep it away from flammable materials.
- The **exhaust fumes from gasoline-powered generators** are another source of carbon monoxide poisoning. Never use a generator in an enclosed area such as a basement or garage. Make sure the area is well-ventilated, dry and preferably covered.
- **Generators also pose electrical hazards.** Do not connect the generator to your home's electrical system. Instead, connect appliances directly to the generator with properly sized polarized extension cords. Do not overload the generator or the cords, and place the cords where no one will trip over them. Be sure the generator is properly grounded (follow the manufacturer's directions). Before refueling, let the engine cool for at least two minutes to prevent fires. Store extra fuel in a safe, dry area.
- **If you are returning to a storm-damaged house,** be particularly careful. Before entering the building, check for structural damage to be sure there is no danger of collapse. Turn off any outside gas lines at the meter or tank and let the house air for a few minutes. Even if the electricity is off in the neighborhood, make sure the electrical power is turned off at the main breaker or fuse box. Electricity and water are a dangerous combination--if you have to step in water to get to the breaker box, call a professional electrician first for advice. Don't turn on any lights, appliances, or gas systems until they've been tested. If you must enter the house at night, use a battery-operated flashlight, never an open flame as a light source, and do not smoke.
- **If the house has been flooded,** electrical wires and appliances will have to be cleaned and thoroughly dried, inside and outside, before they can be safely used again. Contact your electrical power company, the North Carolina Cooperative Extension Service, or a professional electrician for advice.

A study of 2,090 hurricane-related emergency department visits during and after Hurricane Hugo in 1989, conducted by the Centers for Disease Control and Prevention in Atlanta and the North Carolina Department of Environment, Health and Natural Resources, found that 88 percent of the patients were treated for injuries. Insect stings and wounds accounted for nearly half of the total cases. Nearly one-third of the wounds were caused by chain saws. Motor vehicle accidents and falls were also major causes of hurricane-related injuries. Many such injuries can be prevented by being aware of hazards and by avoiding potentially dangerous situations.



# Hurricane Fact Sheet

## After a Flood: Returning to Your Home Safely

A building that has been flooded can be a dangerous place. This brochure will help you understand and protect you and your family from the hazards of flooded buildings. It will also provide you information about cleaning up and making your home safe to live in again.

### ***Watch out for these dangers:***

Never assume that a water-damaged house is safe. Going into a building that has been flooded, even after the water is gone, can present a wide variety of hazards that can cause injury, illness or even death. Do not allow children in the home after the flood or while it is being cleaned, inspected or repaired.

- **Electrical hazards** - Do not enter a flooded or wet building if the power is on. If any electrical circuits have gotten wet, turn off the power at the main breaker or fuse box and leave it off until the electrical wiring or equipment has been inspected and repaired by a licensed electrician and approved by your local building inspector.
- **Structural damage** - Do not enter a building if the framing or foundation is damaged. Look carefully before you enter. Leave immediately if shifting or unusual noises signal a possible collapse of the building. Contact your local building inspector for a safety inspection.
- **Hazardous materials** - Dangerous materials found in flooded homes may include pesticides, fuel oil, gasoline, chemicals and other substances that might have been brought in or spilled by flood waters. Damaged buildings may also contain asbestos and lead-based paint, which can cause health problems during cleanup. Practically any building material that is not obviously solid wood, metal, or glass could contain asbestos. Lead-based paint can be found pre-1978 housing and is still used in commercial and industrial buildings.
- **Animal and insect related hazards** – Look carefully before entering a building to determine if there are displaced animals in the building such as dogs and cats, raccoons and rodents. Watch out for snakes and insects such as wasps, fire ants, and mosquitoes.
- **Injuries** - Falling objects, broken or damaged building components and slick surfaces can cause injuries, broken bones, and cuts. Lifting heavy objects can cause back injuries and muscle strains (see "Stay safe while you work.").
- **Biological hazards** - Bacteria, viruses, fungi, (mold and mildew) and other microorganisms can cause illness when you breathe them in, take them into your body through your mouth, or take them in through non-intact skin. Bacteria, viruses and other microorganisms may be left indoors by floodwater, while mold and mildew may grow indoors after the floodwater has receded.
  - Bacteria and Viruses and other microorganisms - If you accidentally get floodwater or the dirt it leaves behind into your mouth, you might develop gastrointestinal (digestive tract) illness.





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- Mold and Mildew (Fungi) – Mold will grow on many building materials such as furniture, carpet and other items that stay wet for more than 24 hours. Mold colonies are the fuzzy or patchy white, green, brown or black growths that you will see on wallboard, wood furniture and cabinets, clothing, wall studs, and almost any other surface. Molds releases tiny particles into the air that can cause allergic illnesses like hay fever (coughing, sneezing, eye irritation), asthma symptoms, or other respiratory illness that can be serious. Some molds may also produce toxins that could cause other illnesses. We are exposed to mold every day, indoors and out, but mold contamination can be quite severe in a water-damaged building. Health risks are greater for people with allergies or asthma, people with compromised immune systems and for the very old or very young.

### ***Stay safe while you work:***

- Wear a hard hat and safety goggles when there is a danger of falling materials.
- Wear leather work gloves to protect your hands from cuts or rubber gloves to prevent exposure to hazardous chemicals.
- Wear rubber boots or hard-soled boots, preferably with steel toes, when working and lifting.
- Wear a facemask. When you enter a flooded building, wear a dust mask or respirator to reduce your exposure to mold. At hardware or home supply stores, look for a mask with "NIOSH" approval and an N-95 rating. Both of these marks should be on the respirator and the container. Read and follow the instructions on the mask package. Remember that dust masks will only provide protection against solid materials such as dusts and liquids. Dust masks provide no protection against gases and vapors. Dust masks are disposable and should be thrown away at the end of the day.
- Stay alert. Accidents happen when people are tired. Take the breaks you need, and drink plenty of fluids (bottled water, juice, soft drinks) to avoid dehydration. Never drink alcohol when you are working in a flooded building.
- Stay alert for displaced animals, snakes and biting or stinging insects.
- Protect yourself from bacteria, viruses and other microorganisms. To keep from getting sick, wear rubber gloves while working; do not eat, drink, or smoke in the house; wash your hands frequently with soap and rinse with clean water.
- Wet down mold. Before you touch, move, or clean moldy or mildewed materials, wet the mold with a soapy solution from a spray bottle to prevent the mold from getting into the air. Do this even if the material is already wet because the mold probably won't be wet. Remember that mold can still make you sick even after you have sprayed disinfectants ("mold/mildew killer") to kill it.
- Be careful lifting. To avoid back injuries when lifting or handling heavy and bulky loads like furniture or carpet, avoid lifting loads of more than 50 pounds per person.
- Get help. Before you disturb or remove materials that may be hazardous, take precautions to prevent exposure. If there is a noticeable chemical odor and/or a spilled container of a hazardous material in the building, ask your local health department or fire department for help. If there is asbestos or lead paint in the building, call NC Health Hazards Control at (919) 707-5950.





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- Be prepared. If you get a cut or a puncture wound that is exposed to floodwater or the dirt it leaves behind, see a doctor. Make sure your tetanus immunization is up-to-date before you work on the house. Once immunized, adults should have a routine "booster" every ten years.

### ***Take these steps:***

If a flooded building is to be safely reoccupied, it must be completely dry. Dirt and trash left by the flood must be removed from building materials and furnishings. Moldy or mildewed items must be completely cleaned and disinfected or must be thrown away. If not, mold and mildew will return and possibly cause health problems for you and your family in the future.

Before going back to live in your home, take the following steps:

- **Get the mess out.** Remove all floodwater, dirt, and debris left behind by the floodwater.
- **Remove mold and mildew.** Any materials or furnishings that soaked up water should be removed from the building. Other moldy or mildewed building materials should be thoroughly cleaned and dried or removed and replaced.
- **Check out the floors.** Carpet and padding cannot be cleaned well enough to prevent mold and mildew from growing. Throw them away. Take out the flooring and sub-flooring if they cannot be completely cleaned and dried or if they have started to deteriorate. The remaining floor and/or sub-floor must be dried out completely and disinfected. Make sure no moisture is trapped in or on the sub-floor. Sub-flooring made of particleboard or plywood should be removed and replaced because it can't be completely dried and disinfected. Crawl spaces should also be cleaned out and dried.
- **Dry out walls.** Walls that were wet should be stripped to the studs and the insulation removed. Walls must remain open to allow them to completely dry. Other wall cavities should be inspected for visible mold growth. Any area inside a wall cavity with visible mold growth should be opened, cleaned, decontaminated and dried. The exterior of each building (siding, etc.) will need to be evaluated to see if any or all of the exterior materials should be removed. Plaster, brick and concrete block walls can probably be cleaned, disinfected and completely dried.
- **Check Heating Ventilation and Air-Conditioning Systems (HVAC).** If the HVAC system or air ducts were flooded, use special care. The inside parts of heating and air-conditioning systems that contacted floodwater are hiding places for mold. If mold grows in the system, mold particles may get into the air and make people sick. The interior components (furnace, air-conditioner cooling coils, and fans) will need to be inspected, cleaned and decontaminated by professionals. Air registers (vents) and diffusers should be removed, cleaned, disinfected and reinstalled. Replace lined air ducts and ductboard that got wet. Bare sheet metal ductwork can be taken apart, washed, disinfected, dried, and put back together. Air duct cleaning services are not very effective in cleaning flooded air ducts and are only useful on bare sheet-metal ducts.



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- **Salvage what you can.** Personal property and furnishings that are moist or wet 24 hours after floodwater recedes will have mold growing in or on them. Clothing and linens may be salvaged by washing with chlorine bleach and detergent, or sent to commercial laundries or dry cleaners. Upholstered furniture, mattresses, and furniture made of particleboard or wafer board should be thrown away. Get information on saving valuable papers, books, and photographs from the American Red Cross.
- **Remove contaminants.** Make sure that any chemical contamination and hazardous materials have been removed from the building. For proper disposal, contact your local waste disposal service.
- **Make sure that all parts of the building are dry before rebuilding or repairing.** Mold will grow on replacement materials if the studs, subfloor or other building parts are not completely dry. The structure should be tested with a moisture meter before you start replacing the damaged parts of your home.

### ***Clean and dry the right way:***

Nonporous materials (materials that don't soak up water) and furnishings and other surfaces should be thoroughly cleaned, disinfected and allowed to dry completely. First, scrub all surfaces with detergent and water and rinse well. (Scrubbing removes mold, mold spores, and the dirt that mold and mildew can grow on.) Then, disinfect everything. Liquid chlorine bleach should be used to disinfect and kill any remaining mold and mildew. Follow the instructions on the label and let the bleach solution remain on the surface for at least 15 minutes before rinsing and drying. After cleaning and disinfecting, you must completely dry each item or mold and mildew will return. To speed drying, keep fresh air circulating.

In conclusion, the most important thing you can do to protect yourself is to use common sense and be aware of safety and health risks. Do not enter a building that is clearly unsafe. If you have questions or need assistance, contact your local health department or building inspections office.

Other useful information for flood cleanup and health and safety issues can be found at the following web sites:

- [NIOSH](#)
- [CDC](#)
- [American Red Cross](#)
- [EPA](#):
- North Carolina Department of Health and Human Services  
Division of Public Health  
Occupational and Environmental Epidemiology Branch  
(919) 707-5900 | [www.epi.state.nc.us/epi/oii/mold](http://www.epi.state.nc.us/epi/oii/mold)
- North Carolina Department of Crime Control and Public Safety  
Division of Emergency Management  
(919) 733-3867 | [www.ncem.org](http://www.ncem.org)



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Working for a healthier and safer North Carolina  
Everywhere. Everyday. Everybody.

*June 2010*